

Appl. No. 10/629,006
Amendment Dated January 28, 2005
Response to Restriction Requirement of December 28, 2004

Page 2 of 12

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the applications:

Listing of Claims:

Claim 1. (Original) A valve comprising:

a first valve component connectable to one of either a fuel supply or a fuel cell,
a second valve component connectable to the other of either a fuel supply or a fuel cell,
wherein each valve component comprises a housing and a biased slidable inner body, and
wherein the slidable inner body cooperates with a sealing member to form an internal seal in each valve component, and wherein during connection the first valve component and the second valve component form an inter-component seal at least before the internal seals open to create a fluid flow path through the valve.

Claim 2. (Original) The valve of claim 1, wherein the first valve component is connected to the fuel supply and the second valve component is connected to the fuel cell.

Claim 3. (Original) The valve of claim 1, wherein the first valve component is connected to the fuel cell and the second valve component is connected to the fuel supply.

Claim 4. (Original) The valve of claim 1, wherein the slidable inner body is a sphere.

Claim 5. (Original) The valve of claim 1, wherein the slidable inner body comprises a pushrod.

Claim 6. (Original) The valve of claim 1, wherein the slidable inner body is biased by a spring.

Claim 7. (Original) The valve of claim 6, wherein the spring is made from stainless steel.

Claim 8. (Original) The valve of claim 6, wherein the spring is made from an elastomeric material.

Appl. No. 10/629,006
Amendment Dated January 28, 2005
Response to Restriction Requirement of December 28, 2004

Page 3 of 12

Claim 9. (Original) The valve of claim 8, wherein the elastomeric material comprises ethylene propylene, nitrile rubber, ethylene propylene diene methylene terpolymer or fluoro-elastomer.

Claim 10. (Original) The valve of claim 8, wherein the spring has a substantially straight sidewall.

Claim 11. (Original) The valve of claim 8, wherein the spring has substantially wavy sidewall.

Claim 12. (Original) The valve of claim 6, wherein the spring constants of the spring in the valve components are substantially the same.

Claim 13. (Original) The valve of claim 6, wherein the spring constants of the spring in the valve components are substantially different.

Claim 14. (Original) The valve of claim 13, wherein the spring constant of the spring in the valve component connected to the fuel cell is lower than the spring constant of the spring in the valve component connected to the fuel supply.

Claim 15. (Original) The valve of claim 1, wherein the sealing member is an o-ring.

Claim 16. (Original) The valve of claim 15, wherein the internal seal is located between the o-ring and the slidable inner body.

Claim 17. (Original) The valve of claim 1, wherein the sealing member is a sealing face.

Claim 18. (Original) The valve of claim 17, wherein the sealing face is positioned on a front surface of the slidable inner body and the internal seal is located between the sealing face and a portion of the housing.

Claim 19. (Original) The valve of claim 18, wherein the portion of the housing is a lip.

Claim 20. (Original) The valve of claim 17, wherein the sealing face is positioned on the housing and the internal seal is between the sealing face and the slidable inner body.

Appl. No. 10/629,006
Amendment Dated January 28, 2005
Response to Restriction Requirement of December 28, 2004

Page 4 of 12

Claim 21. (Original) The valve of claim 1, wherein the sealing member is an elastomeric ball.

Claim 22. (Original) The valve of claim 1, wherein the inter-component seal is formed by a portion of the housing of the first valve component and the sealing member of the second valve component.

Claim 23. (Original) The valve of claim 1, wherein the inter-component seal is formed by a portion of the housing of the second valve component and the sealing member of the first valve component.

Claim 24. (Original) The valve of claim 1, wherein the inter-component seal is formed between the housing of the first valve component and the housing of the second housing component.

Claim 25. (Original) The valve of claim 1, wherein the inter-component seal is formed before any internal seal opens.

Claim 26. (Original) The valve of claim 1, wherein the inter-component seal is formed after the internal seal of the valve component connected to the fuel cell opens.

Claim 27. (Original) The valve of claim 1, wherein the fluid flow path comprises the space between the housing and the slidable inner body.

Claim 28. (Original) The valve of claim 27, wherein the fluid flow path further comprises at least one channel defined on the slidable inner body.

Claim 29. (Original) The valve of claim 1, wherein the fluid flow path comprises at least one channel defined on one of the slidable inner bodies.

Claim 30. (Original) The valve of claim 1, wherein the fluid flow path comprises a plurality of channels defined on the slidable inner body of both valve components.

Claim 31. (Original) The valve of claim 1, wherein the valve further comprises a liquid retention material surrounding the first and second valve components.

Appl. No. 10/629,006
Amendment Dated January 28, 2005
Response to Restriction Requirement of December 28, 2004

Page 5 of 12

Claim 32. (Original) The valve of claim 1, wherein the valve further comprises a liquid retention material within at least one of the valve components.

Claim 33. (Original) The valve of claim 32, wherein the filler material is located in the downstream direction from the internal seal of the valve component.

Claim 34. (Original) The valve of claim 1, wherein the valve further comprises a retainer to keep the two valve components in the connected position.

Claim 35. (Original) The valve of claim 34, wherein the retainer is a snap-on retainer.

Claim 36. (Original) The valve of claim 34, wherein the retainer comprises a spring arm connected to the first valve component, a head disposed at the end of the arm and a receiving cavity defined on the second valve component, said cavity is sized and dimensioned to receive said head.

Claim 37. (Original) The valve of claim 1, wherein one of the internal seals is opened by a pump.

Claim 38. (Original) The valve of claim 1, wherein one of the internal seals is provided by a pump.

Claim 39. (Original) The valve of claim 1, wherein at least one of the valve components comprises a second internal seal.

Claim 40. (Original) The valve of claim 39, wherein the second internal seal is provided by a closed washer.

Claim 41. (Original) The valve of claim 39, wherein the second internal seal is provided by a duckbill valve.

Claim 42. (Original) The valve of claim 41, wherein the duckbill valve is sized and dimensioned to limit access to said valve component.

Claim 43. (Original) The valve of claim 1, wherein the housing of at least one valve component comprises a nozzle sized and dimensioned to limit access to the internal seal.

Appl. No. 10/629,006
Amendment Dated January 28, 2005
Response to Restriction Requirement of December 28, 2004

Page 6 of 12

Claim 44. (Original) The valve of claim 1, wherein the housing of at least one valve component comprises a sleeve covering the housing and the sleeve is sized and dimensioned to limit access to the internal seal.

Claim 45. (Original) The valve of claim 1, wherein the fuel supply comprises a fuel cartridge.

Claim 46. (Original) The valve of claim 1, wherein the fuel supply comprises a fuel container.

Claim 47. (Original) The valve of claim 1, wherein the fuel supply comprises a fuel line.

Claim 48. (Original) The valve of claim 1, wherein at least one valve component is initially covered by a covering member and the covering member is removed before the valve components are connected to each other.

Claim 49. (Original) The valve of claim 48, wherein the covering member comprises a cap.

Claim 50. (Original) The valve of claim 49, wherein the covering member comprises a film.

Claim 51. (Original) A valve comprising:

- a first valve component connectable to one of either a fuel supply or a fuel cell,
- a second valve component connectable to the other of either a fuel supply or a fuel cell,
- wherein the first valve component comprises a first outer housing and a biased first sleeve and the first sleeve is slidable relative to the outer housing and to a first filler contained within the first sleeve, and wherein the second valve component comprises a second outer housing, a second sleeve and a second filler contained within the second sleeve, and
- wherein during connection the first sleeve and the second sleeve push each other so that the first filler abuts the second filler to form a fluid flow path through the valve.

Claim 52. (Original) The valve of claim 51, wherein the first valve component is connected to the fuel supply and the second valve component is connected to the fuel cell.

Appl. No. 10/629,006
Amendment Dated January 28, 2005
Response to Restriction Requirement of December 28, 2004

Page 7 of 12

Claim 53. (Original) The valve of claim 51, wherein the first valve component is connected to the fuel cell and the second valve component is connected to the fuel supply.

Claim 54. (Original) The valve of claim 51, wherein the second sleeve is fixed relative to the housing.

Claim 55. (Original) The valve of claim 51, wherein during connection the first valve component and the second valve component form an inter-component seal.

Claim 56. (Original) The valve of claim 55, wherein the inter-component seal is formed before the fluid flow path is formed.

Claim 57. (Original) The valve of claim 51, wherein the first slidable sleeve is biased by a spring.

Claim 58. (Original) The valve of claim 51, wherein during connection the first sleeve is pushed back to expose at least a portion of the first filler.

Claim 59. (Original) The valve of claim 58, wherein the second filler is positioned behind the leading edge of the second sleeve to form a cavity in the second sleeve.

Claim 60. (Original) The valve of claim 59, wherein the exposed portion of the first filler is sized and dimensioned to be received in said cavity.

Claim 61. (Original) The valve of claim 51, wherein the second filler is positioned behind the leading edge of the second sleeve to form a cavity in the second sleeve.

Claim 62. (Original) The valve of claim 51, wherein the valve further comprises a liquid retention material positioned spaced apart from the fluid flow path.

Claim 63. (Original) The valve of claim 62, wherein the liquid retention material comprises hydrophilic material.

Appl. No. 10/629,006
Amendment Dated January 28, 2005
Response to Restriction Requirement of December 28, 2004

Page 8 of 12

Claim 64. (Original) The valve of claim 62, wherein the liquid retention material comprises liquid swellable material.

Claim 65. (Original) The valve of claim 62, wherein the liquid retention material comprises additive.

Claim 66. (Original) The valve of claim 65, wherein the additive mixes with the fuel.

Claim 67. (Original) The valve of claim 62, wherein the liquid retention material disposed in the annular area between the outer housing and the sleeve in at least one of the valve components.

Claim 68. (Original) The valve of claim 51, wherein the valve further comprises a retainer to keep the two valve components in the connected position.

Claim 69. (Original) The valve of claim 68, wherein the retainer is a snap-on retainer.

Claim 70. (Original) The valve of claim 68, wherein the retainer comprises a spring arm connected to the first valve component, a head disposed at the end of the arm and a receiving cavity defined on the second valve component, said cavity is sized and dimensioned to receive said head.

Claim 71. (Original) The valve of claim 51, wherein the housing of at least one valve component comprises a leading member sized and dimensioned to limit access to the filler.

Claim 72. (Original) The valve of claim 71, wherein leading member comprises an outer sleeve.

Claim 73. (Original) The valve of claim 51, wherein at least one valve component is initially covered by a covering member and the covering member is removed before the valve components are connected to each other.

Claim 74. (Original) The valve of claim 73, wherein the covering member comprises a cap.

Claim 75. (Original) The valve of claim 73, wherein the covering member comprises a film.

Appl. No. 10/629,006
Amendment Dated January 28, 2005
Response to Restriction Requirement of December 28, 2004

Page 9 of 12

Claim 76. (Original) The valve of claim 51, wherein the fuel supply comprises a fuel cartridge.

Claim 77. (Original) The valve of claim 51, wherein the fuel supply comprises a fuel container.

Claim 78. (Original) The valve of claim 51, wherein the fuel supply comprises a fuel line.

Claim 79. (Original) A valve comprising:

- a first valve component connectable to one of either a fuel supply or a fuel cell,
- a second valve component connectable to the other of either a fuel supply or a fuel cell,
- wherein the first valve component comprises a housing and a biased slidable inner body, and wherein the slidable inner body cooperates with a sealing member to form an internal seal in the first valve component, and the second valve component comprises a duckbill valve;
- wherein during connection the housing of the first valve component enters the duckbill valve to open the internal seal of the duckbill valve, and first valve component and the duckbill valve form an inter-component seal at least before the internal seals open to create a fluid flow path through the valve.

Claim 80. (Original) The valve of claim 79, wherein a pump opens the internal seal in the first valve component.

Claim 81. (Original) The valve of claim 79, wherein the duckbill valve comprises a plurality of wipers that form at least one chamber with the outer surface of the housing of the first valve component and wherein a pressurized liquid can expand in the chamber.

Claim 82. (Original) The valve of claim 79, wherein the duckbill valve comprises a retention material to absorb liquid.

Claim 83. (Currently amended) The valve of claim ~~69~~ 79, wherein the duckbill valve comprises an additive capable of mixing with the fuel.

Claim 84. (Original) The valve of claim 79, wherein the second valve component further comprises a housing and a biased slidable inner body, and wherein the slidable inner body cooperates with a sealing member to form an internal seal in the second valve component.

Appl. No. 10/629,006
Amendment Dated January 28, 2005
Response to Restriction Requirement of December 28, 2004

Page 10 of 12

Claim 85. (Original) A valve comprising:

a first valve component connectable to one of either a fuel supply or a fuel cell,
a second valve component connectable to the other of either a fuel supply or a fuel cell,
wherein the first valve component connects to the second valve component to form a fluid flow path through the valve, and
wherein the valve further comprises a retention material capable of absorbing liquid remaining in the valve when the first valve component disconnects from the second valve component.

Claim 86. (Original) A valve comprising:

a first valve component connectable to one of either a fuel supply or a fuel cell,
a second valve component connectable to the other of either a fuel supply or a fuel cell,
wherein the first valve component connects to the second valve component to form a fluid flow path through the valve and at least one of the valve components comprises an internal seal and a fluid retention material capable of retaining liquid.

Claim 87. (Original) The valve of claim 86, wherein the retention material is located in front of the internal seal.

Claim 88. (Original) The valve of claim 86, wherein the retention material is located in behind the internal seal.

Claim 89. (Original) A valve comprising:

a first valve component connectable to one of either a fuel supply or a fuel cell,
a second valve component connectable to the other of either a fuel supply or a fuel cell,
wherein the first valve component connects to the second valve component to form a fluid flow path through the valve and wherein one of the valve components comprises an internal seal formed by a slidable inner body biased against a sealing member and the other valve component comprises an internal seal provided by a pump.

Claim 90. (Original) A valve comprising:

a first valve component connectable to one of either a fuel supply or a fuel cell,

Appl. No. 10/629,006
Amendment Dated January 28, 2005
Response to Restriction Requirement of December 28, 2004

Page 11 of 12

a second valve component connectable to the other of either a fuel supply or a fuel cell, wherein the first valve component connects to the second valve component to form a fluid flow path through the valve and at least one valve component comprises an internal seal and a leading member sized and dimensioned to limit access to the internal seal.

Claim 91. (Original) The valve of claim 90, wherein the leading member is a nozzle.

Claim 92. (Original) The valve of claim 90, wherein the leading member is an outer sleeve.

Claim 93. (Original) The valve of claim 90, wherein the leading member is sized and dimensioned to limit access to the internal seal by a user's finger.

Claim 94. (Original) The valve of claim 90, wherein the leading member is sized and dimensioned to limit access to the internal seal the pulp of a user's finger.

Claim 95. (Original) The valve of claim 90, wherein the inner diameter of the leading member is about 10 mm or less.

Claim 96. (Original) The valve of claim 95, wherein the inner diameter of the leading member is about 5 mm or less.

Claim 97. (Original) The valve of claim 90, wherein the depth of the leading member is about 2 mm or more.

Claim 98. (Original) The valve of claim 97, wherein the depth of the leading member is about 5 mm or more.

Claim 99. (New) The valve of claim 1, wherein the biasing force in the valve components are different.